June 13, 2005

IODP EXPEDITION 308:
GULF OF MEXICO HYDROGEOLOGY
WEEK 2 REPORT

OPERATIONS

Hole U1319A: The *JOIDES Resolution* arrived at Site U1319 on June 6th and a beacon was deployed at 1350 hr. The T2P probe was first deployed above the seafloor, close to the mudline, to test that it could be deployed through the BHA and that the pressures measured were reasonable; the test was a success. A VIT survey was conducted prior to spudding. Electrical control problems associated with the mud pumps delayed operations for 45 minutes, and Hole U1319A was spudded at 0130 hr on 7 June. The seafloor depth was estimated to be at 1440.0 mbrf based on core recovery. Piston coring with non-magnetic hardware advanced to a depth of 114.6 mbsf (U1319A-13H). Coring was then continued with the extended core barrel system (XCB) to a total depth of 157.5 mbsf. The total average recovery for this hole was 98.6%. The T2P probe was deployed in Hole U1319A for the first time at a depth of 80.5 mbsf for 30-minutes, but the tip of the probe was bent due to formation stiffness. The bit was pulled clear of the hole at 2120 hr on 7 June and raised to 240 m above the seafloor. The vessel was then offset 2.3 nmi in dynamic positioning mode to Site U1320 at an average speed of 0.9 knots.

Hole U1320A: A beacon was dropped at Site U1320A at 0040 hr on 8 June. The VIT was launched and the drill string lowered to 1469.6 mbrf, and the vessel was offset five m north after spotting a man-made object on the seafloor (probably a garbage bag). Hole U1320A was spudded at 0420 hr on 8 June. The seafloor depth was established at 1480.4 mbrf based on recovery. Piston coring advanced to 69.4 mbsf where a sandy layer prevented further penetration; coring continued with the XCB system to 299.6 mbsf (U1320A-33X). The T2P probe was deployed at 126.3 mbsf (U1320A-15X) and 231 mbsf (U1320A-24X), and temperature and pressure were successfully recorded. The first DVTPP temperature measurement was made at 203.4 mbsf (U1320A-23X), followed by a second measurement at 299.6 mbsf. APC recovery was 101.9% whereas XCB recovery averaged 78.3% (the recovery for the total cored interval was 83.7%). A supply boat (M/V *EMILY G*) arrived at 0415 hr on 10 June to discharge the MWD drilling hardware; the boat departed at 0520 hr. Downhole logging of Hole U1320A was undertaken with three tool strings: the Triple combo, FMS-sonic, and the Well Seismic Tool (WST). All tools reached the bottom of the hole and good logs were obtained. The VIT was deployed and the hole was observed as the drill string was pulled clear of the sea floor at 1930 hr on 10 June. The logging mud quickly obstructed the view and the camera was promptly recovered.

Hole U1320B: Hole 1320B was spudded with a MWD drilling assembly at 0915 hr on 11 June. The seafloor was established at a depth of 1485.0 mbrf. After washing in the bit to 14.9 mbsf, the VIT was retrieved. MWD drilling was initiated and continued at an average rate of penetration of 25.4 m/hr to 320.0 mbsf, which was reached at 0325 hr on 12 June. The bit was pulled out of the hole and cleared the seafloor at 0520 hr on 12 June. The drill string was positioned 250 m above the seafloor and the vessel was offset 2.3 nmi back to Site U1319 at an average speed of 0.9 knots in DP mode.

Hole U1319B: The position of Hole U1319B was 20 m north of Hole U1319A. Hole 1319B was spudded at 1105 hr on 12 June as the driller observed the bit contacting the seafloor at a depth of 1447.0 mbrf. MWD drilling advanced to 180 mbsf at an average rate of penetration of 30 m/hr by 2100 hr on 12 June.

PRELIMINARY SCIENCE RESULTS

The second week of Expedition 308 was dedicated to drilling operations at two normally-pressured sites in the Brazos Trinity Basin, IODP Site U1319 (Prospectus site BT4-4A) and IODP Site U1320 (Prospectus site BT4-2A).

The lithologies recovered at Sites U1319 and U1320 included hemipelagic clays, with intervals of sandy turbidites. A 2-cm thick white ash layer (ash layer Y8) was recovered at both sites, which provides a regional stratigraphic marker dated at 84000 years BP based on previous work. Biostratigraphy and magnetostratigraphy results concur with each other and with the location and proposed age of ash layer Y8. The age of the entire sedimentary sequence recovered is estimated to be between stages MIS 1 and MIS 6. Good quality wireline and MWD/LWD logging data were obtained at Site U1320. These data document alternating mud and sand beds in the upper 174 mbsf. Beneath this depth, predominantly mudstone was encountered.

The preliminary data and sedimentological observations in the Brazos-Trinity basin confirm regional interpretations of a lower hemipelagic unit containing very fine-grained distal turbidites that is overlain by a complex of turbidite fan deposits (i.e., more sandy intervals). The upper turbidite sediment package at Site U1320 is expanded and sandier relative to Site U1319. This was expected as it is positioned at the center of the Brazos Trinity IV minibasin. By combining results from downhole logging with seismic data and lithostratigraphic interpretations, we will better constrain the lateral variation and pinching of these sandy turbidites.

The ability to measure in-situ formation pressure and temperature is critical to Expedition 308. Four deployments of the experimental temperature-two-pressures probe (T2P) resulted in successful recording of pressure and temperature. Preliminary results indicate that 1) the T2P is a viable tool to measure in-situ formation pressure and temperature, and 2) the geothermal gradient in the Brazos Trinity basin is about 20 ºC/Km. This is less than a typical geothermal gradient of 30ºC/Km, but is not unexpected on a passive margin with high sedimentation rates such as the U.S. Gulf coast.

TECHNICAL SUPPORT ACTIVITES

During the week of June 6 the shipboard laboratories were busy processing cores and samples as coring was completed at Sites U1319A and U1320A. A Vertical seismic Profile/Check Shot logging run was successfully completed on Hole U1320A on 10 June.

HSE ACTIVITES

A fire and boat drill was held on 11 June for the entire ship's complement. The Marine Emergency Team, (MET team) mustered on the catwalk during the fire drill. They were issued bunker gear, discussed assembly points and future training.